Attachment 10

Duct Modification Plan
Mechanical Plan

Mechanical Plan

Phase I Decontamination and Deconstruction Project
Vernon, CA 90058

Prepared for

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Contents

Duct Modification Narrative

1.1 Introduction

This plan has been created for Phase 1 of the decommissioning of Exide Technologies at 2700 S. Indiana St. in Vernon, CA.

1.2 Purpose

The purpose of this plan is to show that negative pressure will be maintained inside the buildings and enclosures utilizing existing baghouses during the segmented deconstruction in accordance with the Closure Plan and AQMD Rule 1420.1.

Per Rule 1420.1, all enclosures shall be maintained continuously at a negative pressure of at least 0.011 inches H_2O (0.02 mm of Hg), however, AIS chooses to maintain a minimum negative pressure rating of at least 0.02" of H_2O to increase safety for its workers and those outside of the enclosures. In addition, the in-draft air velocity will be maintained at greater than 300 fpm. The calculations below are based on Baghouse flow rates from 2013 (Torits, Soft Lead), 2008 (MAC), and 2006 (Material Storage) source test data provided by Exide. Please note that the calculations presented are designed to be conservative to create an increased level of safety.

	Enclosure Type		
	Segment 1 Location	Segment 2 Location	Segment 3 Location
During Segment 1 Activities	Temporary Enclosure (HAKI)	Existing Building	Existing Building
During Segment 2 Activities	Not applicable - removed	Temporary Enclosure (HAKI)	Existing Building
During Segment 3 Activities	Not applicable - removed	Not applicable - removed	Temporary Enclosure (HAKI)

2.1 Engineering Controls

2.2 Segment 1

Refer to Segment 1 calculations:

The Hard Lead Baghouse can be shutdown at this time but will remain operational until lead from kettles has been removed.

Ducting will be added to the Material baghouse to serve the Segment 1 enclosure (Reverb Feed Room & RMPS) in conjunction with the MAC baghouse. Both the engineered and the truck access openings can be open at the same time while still reaching or exceeding the established negative pressure requirement. The in-draft velocity of 300 fpm at doorways and truck access openings will be maintained as well. The negative pressure reading inside the

Segment 1 enclosure will be 0.03" of H_2O. (see section IIC of calculations). Existing manometers inside the enclosure (units LF1, LF3, STA2, STA3, BH1, TN, TS, BS, NRMPS) will be taken off line and will be replaced with 3 portable manometers (see sheet M-2).

Should the contractor (AIS) decide to create a 12'x12' opening for crane access during stack removal, either selected engineered openings must be closed or the truck access opening must be kept closed prior to and during the stack removal to maintain a negative pressure of at least 0.02" of H2O.

The 2 Torit baghouses, Soft Lead baghouse, and MAC baghouse will remain in operation to serve both the Baghouse building and East Smelter building & Blast Feed Room. For make-up air, both the existing louvers (see sheet M-2) and the truck access opening can be open at the same time. The in-draft velocity at these openings is greater than 300 fpm. The negative pressure reading inside the Baghouse and Smelter buildings will be 0.03" of H_2O - greater than minimum goal of 0.02" of H_2O. (see section IIIC of calculations). The remaining manometers (W1, W2, W3, A, B, C, CDR, STA1, STA 4, BHN1 & BHN2) will monitor these buildings.

2.3 Segment 2

Refer to Segment 2 calculations:

The MAC baghouse can be shutdown at this time.

The 2 Torit baghouses will serve the Segment 2 enclosure (Smelter building & Blast Feed Room). For make-up air, both the engineered openings and the truck access opening can be open at the same time. The in-draft velocity at these openings will be greater than 300 fpm. The negative pressure reading inside the Segment 2 enclosure will be 0.05" of H_2O (see section IIC of calculations). Existing manometers inside the enclosure (units A, B, C, STA1, and CDR) will be taken off line and replaced with 2 portable manometers (see sheet M-3).

Should the contractor (AIS) decides to create a 12'x12' opening for crane access during stack removal, either selected engineered openings must be closed or the truck access opening must be kept closed prior to and during the stack removal to maintain a negative pressure of at least 0.02" of H_2O.

The Material storage baghouse & the Soft Lead baghouse will remain in operation to serve the central building (Baghouse building). For make-up air, both the existing louvers (7 will remain open and cover the 3 louvers, see sheet M-3) and the truck access opening can be open at the same time. The in-draft velocity at these openings is greater than 300 fpm. The negative pressure reading inside the Baghouse building will be 0.02" of H_2O (see section IIIC of calculations). The existing manometers (BHN1 & BHN2) will continue to monitor this building. Manometers (STA4, W1, W2, W3 will monitor Finished Lead bldg.)

2.3 Segment 3

Refer to Segment 3 calculations:

The Soft Lead baghouse can be shutdown at this time. The Material storage baghouse can be shut down at the contractor's discretion.

Ducting from the 2 Torit baghouses will be routed to serve the Segment 3 enclosure (Baghouse building). For make-up air, both the engineered openings and the truck access opening can be open at all times. The in- draft velocity at these openings is greater than 300 fpm. The negative pressure reading inside the central building will be 0.05" of H_2O (see section IIC of calculations). Remove all existing manometers inside the enclosure and replace them with 4 new manometers (see sheet M-4).

Should the contractor (AIS) decides to create a 12'x12' opening for crane access during stack removal, either selected engineered openings must be closed or the truck access opening must be kept closed prior to and during the stack removal to maintain a negative pressure of at least 0.02" of H_2O.

3.0 Conclusion

Once decontamination of Segment 3 is complete and confirmed clean, the Torit will be shut down and decontaminated within a temporary negative air enclosure.

Calculations

Symbol	Description	Unit
ΔP	Differential Pressure	inches of H_2O or "water
Q_S	Room leakage flow rate	ft^3/min
A	Net open area of the room	ft^2
v	Air velocity in the open area	ft/min
2610	Conversion factor	
$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2$	Formula to calculate differential pressure	inches of H_2O or "water
$v = \frac{Q_S}{A}$	Formula to calculate air velocity	ft/min

I. BAGHOUSES FOR SEGMENT 1

IF MAC BAGHOUSE ONLY (80,000 CFM USED OF 104,888 CFM AVAILABLE. REMAINING USED IN SEGMENT 2 & 3 BUILDINGS DURING SEGMENT 1 WORK.)

A) ONLY ENGINEERED OPENINGS (TOTAL AREA OF 144 S.F.) ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{80{,}000\frac{ft^3}{\min}}{(2610)(144\,ft^2)}\right]^2 = 0.05"\,water$$

$$v = \frac{Q_S}{A} = \frac{80{,}000\frac{ft^3}{\min}}{144\,ft^2} = 556\frac{ft}{\min}$$

B) ONLY TRUCK ACCESS IS OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{80{,}000\frac{ft^3}{\min}}{(2610)(210\,ft^2)}\right]^2 = 0.02"\,water$$

$$v = \frac{Q_S}{A} = \frac{80{,}000\frac{ft^3}{\min}}{210\,ft^2} = 381\frac{ft}{\min}$$

C) IF BOTH ENGINEERED OPENINGS AND TRUCK ACCESS ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{80{,}000\frac{ft^3}{\min}}{(2610)(354\,ft^2)}\right]^2 = 0.008"\,water$$

$$v_{opening} = \frac{Q_S}{A} = \frac{32{,}800\frac{ft^3}{\min}}{144\,ft^2} = 228\frac{ft}{\min}$$

$$v_{truck\ access} = \frac{Q_S}{A} = \frac{47{,}200\frac{ft^3}{\min}}{210\,ft^2} = 225\frac{ft}{\min}$$

NOT ENOUGH, ADD MATERIAL STORAGE BAGHOUSE (85,000 CFM) FOR A TOTAL OF 165,000 CFM

II. PRESSURE & AIR VELOCITY IF:

A) ONLY ENGINEERED OPENINGS (TOTAL AREA OF 144 S.F.) ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{165{,}000\frac{ft^3}{\min}}{(2610)(144\,ft^2)}\right]^2 = 0.19"\,water$$

$$v = \frac{Q_S}{A} = \frac{165{,}000\frac{ft^3}{\min}}{144\,ft^2} = 1{,}146\frac{ft}{\min}$$

B) ONLY TRUCK ACCESS IS OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{165{,}000\frac{ft^3}{\min}}{(2610)(210\,ft^2)}\right]^2 = 0.09"\,water$$

$$v = \frac{Q_S}{A} = \frac{165{,}000\frac{ft^3}{\min}}{210\,ft^2} = 786\frac{ft}{\min}$$

C) IF BOTH ENGINEERED OPENINGS AND TRUCK ACCESS ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{165{,}000\frac{ft^3}{\min}}{(2610)(354\,ft^2)}\right]^2 = 0.03"\,water$$

$$v_{opening} = \frac{Q_S}{A} = \frac{67{,}650\frac{ft^3}{\min}}{144\,ft^2} = 470\frac{ft}{\min}$$

$$v_{truck\ access} = \frac{Q_S}{A} = \frac{97{,}350\frac{ft^3}{\min}}{210\,ft^2} = 464\frac{ft}{\min}$$

III. PRESSURE IN SEGMENT 2 & 3 BUILDINGS DURING SEGMENT 1.

THE BAGHOUSES THAT WILL REMAIN IN OPERATION ARE THE 2 TORIT BAGHOUSES (203,986 CFM), SOFT LEAD BAGHOUSE (92,349 CFM), AND MAC BAGHOUSE (REMAINING 24,888 CFM FROM 104,888 TOTAL CFM).

PRESSURE & AIR VELOCITY IF:

A) ONLY EXISTING LOUVERS (TOTAL AREA OF 364 S.F.) ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{321{,}223\frac{ft^3}{\min}}{(2610)(364\,ft^2)}\right]^2 = 0.11"\,water$$

$$v = \frac{Q_S}{A} = \frac{321{,}223\frac{ft^3}{\min}}{364\,ft^2} = 882\frac{ft}{\min}$$

B) ONLY TRUCK ACCESS IS OPEN (SEGMENT 3 LARGE OPENING AT CORRIDOR)

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{321{,}223\frac{ft^3}{\min}}{(2610)(236\,ft^2)}\right]^2 = 0.27"\,water$$

$$v = \frac{Q_S}{A} = \frac{321{,}223\,\frac{ft^3}{\min}}{236\,ft^2} = 1361\,\frac{ft}{\min}$$

C) IF BOTH EXISTING LOUVERS ((10) BAGHOUSE LOUVERS & (3) BLAST FEED ROOM LOUVERS) AND LARGE SINGLE TRUCK ACCESS ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{321{,}223\,\frac{ft^3}{\min}}{(2610)(600\,ft^2)}\right]^2 = 0.04"\,water$$

$$v_{opening} = \frac{Q_S}{A} = \frac{195{,}946\,\frac{ft^3}{\min}}{364\,ft^2} = 538\,\frac{ft}{\min}$$

$$v_{\text{truck }access} = \frac{Q_S}{A} = \frac{125{,}277\,\frac{ft^3}{\min}}{236\,ft^2} = 531\,\frac{ft}{\min}$$

I. BAGHOUSES FOR SEGMENT 2

IF 2 TORIT BAGHOUSES (203,986 CFM) AND MATERIAL STORAGE BAGHOUSE (9,500 CFM OF 95,358 CFM) WILL BE IN OPERATION (TOTAL OF 213,486 CFM)

II. PRESSURE & AIR VELOCITY IF:

A) ONLY ENGINEERED OPENINGS (TOTAL AREA OF 144 S.F.) ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{213{,}486\,\frac{ft^3}{\min}}{(2610)(144\,ft^2)}\right]^2 = 0.32"\,water$$

$$v = \frac{Q_S}{A} = \frac{203{,}986\,\frac{ft^3}{\min}}{144\,ft^2} = 1{,}483\,\frac{ft}{\min}$$

B) ONLY TRUCK ACCESS IS OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{213{,}486\frac{ft^3}{\min}}{(2610)(236\,ft^2)}\right]^2 = 0.12"\,water$$

$$v = \frac{Q_S}{A} = \frac{213{,}486\frac{ft^3}{\min}}{236\,ft^2} = 905\frac{ft}{\min}$$

C) IF BOTH ENGINEERED OPENINGS AND CORRIDOR TRUCK ACCESS ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{213{,}486\frac{ft^3}{\min}}{(2610)(380\,ft^2)}\right]^2 = 0.05"\,water$$

$$v_{opening} = \frac{Q_S}{A} = \frac{81{,}125\frac{ft^3}{\min}}{144\,ft^2} = 563\frac{ft}{\min}$$

$$v_{\text{truck }access} = \frac{Q_S}{A} = \frac{132{,}361\frac{ft^3}{\min}}{236\,ft^2} = 561\frac{ft}{\min}$$

III. PRESSURE IN THE SEGMENT 3 BUILDING DURING SEGMENT 2 IF BOTH THE MATERIAL BAGHOUSE (85,858 CFM REMAINING) & SOFT LEAD BAGHOUSE (92,349 CFM) ARE IN OPERATION (TOTAL OF 178,207 CFM)

PRESSURE & AIR VELOCITY IF:

A) ONLY 7 EXISTING LOUVERS (CLOSE (3) EXISTING LOUVERS TO LEAVE (7) OPENINGS FOR A TOTAL OF 217 S.F.) ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{178{,}207\frac{ft^3}{\min}}{(2610)(217\,ft^2)}\right]^2 = 0.10"\,water$$

$$v = \frac{Q_S}{A} = \frac{178{,}207\,\frac{ft^3}{\min}}{217\,ft^2} = 821\,\frac{ft}{\min}$$

B) ONLY CORRIDOR TRUCK ACCESS IS OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{178{,}207\,\frac{ft^3}{\min}}{(2610)(236\,ft^2)}\right]^2 = 0.08"\,water$$

$$v = \frac{Q_S}{A} = \frac{178{,}207\,\frac{ft^3}{\min}}{236\,ft^2} = 755\,\frac{ft}{\min}$$

C) IF BOTH EXISTING LOUVERS AND CORRIDOR TRUCK ACCESS ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{178{,}207\,\frac{ft^3}{\min}}{(2610)(453\,ft^2)}\right]^2 = 0.02"\,water$$

$$v_{opening} = \frac{Q_S}{A} = \frac{85{,}539\,\frac{ft^3}{\min}}{217\,ft^2} = 394\,\frac{ft}{\min}$$

$$v_{truck\ access} = \frac{Q_S}{A} = \frac{92{,}668\,\frac{ft^3}{\min}}{236\,ft^2} = 393\,\frac{ft}{\min}$$

I. BAGHOUSES FOR SEGMENT 3

IF 2 TORIT BAGHOUSES ONLY (203,986 CFM)

II. PRESSURE & AIR VELOCITY IF:

A) ONLY ENGINEERED OPENINGS (TOTAL AREA OF 144 S.F.) ARE OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{203{,}986\,\frac{ft^3}{\min}}{(2610)(144\,ft^2)}\right]^2 = 0.29"\,water$$

$$v = \frac{Q_S}{A} = \frac{203{,}986 \frac{ft^3}{\min}}{144\, ft^2} = 1{,}417 \frac{ft}{\min}$$

B) ONLY CORRIDOR TRUCK ACCESS IS OPEN

$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{203{,}986 \frac{ft^3}{\min}}{(2610)(236\, ft^2)}\right]^2 = 0.11" water$$

$$v = \frac{Q_S}{A} = \frac{203{,}986 \frac{ft^3}{\min}}{236\, ft^2} = 864 \frac{ft}{\min}$$

C) IF BOTH ENGINEERED OPENINGS AND CORRIDOR TRUCK ACCESS ARE OPEN

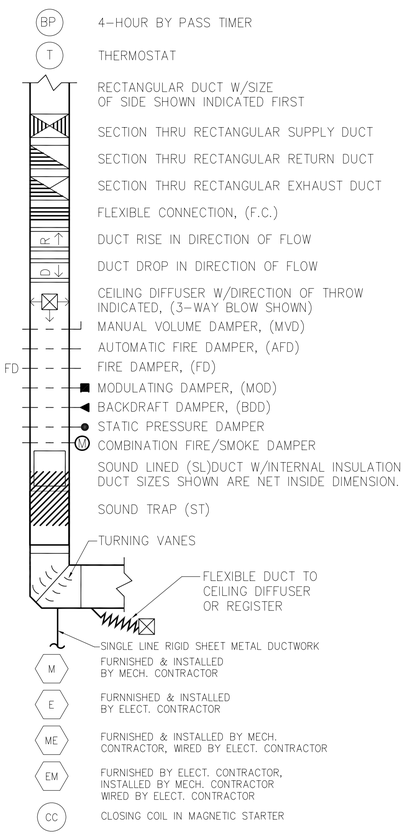
$$\Delta P = \left[\frac{Q_S}{(2610)(A)}\right]^2 = \left[\frac{203{,}986 \frac{ft^3}{\min}}{(2610)(380\, ft^2)}\right]^2 = 0.04" water$$

$$v_{opening} = \frac{Q_S}{A} = \frac{77{,}515 \frac{ft^3}{\min}}{144\, ft^2} = 538 \frac{ft}{\min}$$

$$v_{truck\ access} = \frac{Q_S}{A} = \frac{126{,}471 \frac{ft^3}{\min}}{236\, ft^2} = 536 \frac{ft}{\min}$$

Attachment 1: Drawings

LEGEND AND ABBREVIATIONS



ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
BEL	BELOW
BTU	BRITISH THERMAL UNIT
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CSFD	CEILING SMOKE–FIRE DAMPER
CWS	CONDENSATE WATER SUPPLY
CWR	CONDENSATE WATER RETURN
DB	DRY BULB
DN	DOWN
DTR	DOWN THRU ROOF
EA	EXHAUST AIR
(E)	EXISTING
ENT	ENTERING
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
F.A.	FACE AREA
F	FAHRENHEIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FLEX	FLEXIBLE
FLR	FLOOR
GALV.	GALVANIZED
GA	GAUGE
HP	HORSEPOWER
IN	INCH
LBS	POUNDS
LVG	LEAVING
MAX	MAXIMUM
MBH	1000 BTU'S PER HOUR
MIN	MINIMUM
MOP	MAX. OVER CURRENT PROTECTION
MVD	MANUAL VOLUME DAMPER
MCA	MIN. CIRCUIT AMPACITY
NTS	NOT TO SCALE
OBD	OPPOSED BLADE VOLUME DAMPER
OPER. WT.	OPERATING WEIGHT
OPG	OPENING
OSA	OUTSIDE AIR
PD	PRESSURE DROP
PH	PHASE
PRESS	PRESSURE
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
REQ'D	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
ø	ROUND DUCT
SA	SUPPLY AIR
SP	STATIC PRESSURE
SF	SQUARE FEET
SWD	SIDE WALL DIFFUSER
SWR	SIDE WALL REGISTER
TEMP	TEMPERATURE
TYP	TYPICAL
UTR	UP THRU ROOF
V	VOLT
W/	WITH
WB	WET BULB
(N)	NEW

AIR CONDITIONING REQUIREMENTS

1. A. FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT AND FACILITIES NECESSARY TO FURNISH, FABRICATE, DELIVER, STORE AND INSTALL ALL WORK NOTED ON THE DRAWINGS AND/OR SPECIFIED HEREIN.

   B. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL WORK NECESSARY TO MAKE A COMPLETE SYSTEM WHETHER OR NOT SUCH DETAILS ARE MENTIONED IN THESE SPECIFICATIONS OR SHOWN ON THE PLANS, BUT WHICH ARE OBVIOUSLY NECESSARY TO MAKE A COMPLETE SYSTEM, EXCEPTING ONLY THOSE PORTIONS THAT ARE SPECIFICALLY MENTIONED HEREIN OR PLAINLY MARKED ON THE ACCOMPANYING DRAWINGS AS BEING INSTALLED UNDER ANOTHER SECTION OF THE SPECIFICATIONS.

2. WORKMANSHIP: THE WORK SHALL BE ACCOMPLISHED IN A THOROUGH AND WORKMAN–LIKE MANNER SATISFACTORY TO AND MEETING THE APPROVAL OF THE OWNER.

3. MATERIALS: ALL MATERIALS, APPLIANCES AND EQUIPMENT SHALL BE NEW AND THE BEST OF THEIR RESPECTIVE KIND, FREE FROM ALL DEFECTS AND OF THE MAKE, BRAND AND QUALITY SPECIFIED.

4. SITE INSPECTION: CONTRACTOR SHALL VISIT THE SITE OF WORK PRIOR TO SUB–MISSION OF HIS BID AND THOROUGHLY FAMILIARIZE HIMSELF WITH THE WORKING CONDITIONS & EXACT NATURE OF THE WORK. SUBMISSION OF A BID ACKNOWLEDGES FULL RESPONSIBILITY FOR FURNISHING A COMPLETE AND FUNCTIONAL SYSTEM. NO CHANGES IN CONTRACT WILL BE MADE TO ACCOMMODATE OR ALLOW EXTRA FUNDS FOR ANY OMISSION WHICH RESULTS FROM A FAILURE TO THOROUGHLY MAKE THE EXAMINATION.

5. CODES AND PERMITS: ALL MECHANICAL EQUIPMENT, INSTALLATION, ETC., SHALL CONFORM TO CALIFORNIA MECHANICAL CODE (CMC 2013) AND OTHER APPLICABLE CODES. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION REPORTS SHALL BE SUBMITTED TO THE ARCHITECT.

6. AS–BUILTS: CONTRACTOR SHALL PROVIDE A COMPLETE SET OF AS–BUILTS TRANSPAREN–CIES WITH ALL CHANGES NOTED THEREON AT THE COMPLETION OF THE PROJECT AND PRIOR TO FINAL ACCEPTANCE.

7. GUARANTEE: CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE ALL LABOR AND MATER–IALS ON ALL WORK AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR.

8. SUBMITTALS: CATALOG INFORMATION AND CUTS OF ALL MECHANICAL EQUIPMENT AND DEVICES SHALL BE SUBMITTED FOR REVIEW (SIX COPIES OF EACH).

9. COORDINATION: THE DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW SCOPE. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES TO PROVIDE BEST ARRANGEMENT OF ALL DUCTS, PIPES, CONDUIT, ETC. LOCATION OF EXISTING PIPING AND DUCTWORK SHOWN IS APPROXIMATE; CONTRACTOR SHALL VERIFY THEIR LOCATION PRIOR TO BEGINNING WORK OF THIS SECTION AND SHALL MAKE MODIFICATIONS AND ADJUSTMENTS REQUIRED TO INSTALL THE WORK OF THIS SECTION.

10. CUTTING AND PATCHING: ALL CUTTING AND PATCHING REQUIRED OF THE EXISTING STRUCTURE SHALL BE PROVIDED UNDER OTHER SECTIONS OF THE WORK. PROVIDE NECESSARY REQUIREMENTS TO THE PROJECT SUPERINTENDENT.

11. CLEANUP: UPON COMPLETION OF THE WORK UNDER THIS SECTION, THE CONTRACTOR SHALL REMOVE ALL SURPLUS MATERIALS, EQUIPMENT AND DEBRIS INCIDENTAL TO THIS WORK AND LEAVE THE PREMISES CLEAN AND ORDERLY.

12. DUCTWORK:
   A. DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH 2013 CALIFORNIA MECHANICAL CODE AND SMACNA STANDARDS.
   B. DUCTWORK SHALL BE GALVANIZED STEEL.
   C. DOUBLE THICKNESS TURNING VANES SHALL BE USED ON ALL DUCT TURNS OF 90°
   D. ALL DUCT JOINTS SHALL BE SEALED AIR TIGHT WITH APPROVED SEALER & DUCT TAPE.
   E. FLEXIBLE DUCT USED FOR CONDITIONED AIR SHALL BE U.L. APPROVED, VINYL COATED, WIRE REINFORCED FIBERGLASS, WITH MAXIMUM CONDUCTANCE OF .30 AND A MAXIMUM LENGTH OF SEVEN FEET.
   F. FLEXIBLE DUCT SIZING SHALL BE PER DIFFUSER SCHEDULE – SAME SIZE AS DIFFUSER NECK. TRANSITION AS NEEDED FROM SMALLER DIAMETER HARD DUCT TO LARGER DIAMETER FLEX DUCT.
   G. MANUAL VOLUME DAMPERS, U.O.N. AS OPPOSED BLADE DAMPERS, SHALL BE INSTALLED AS A MEANS TO BALANCE AIR FLOW AT ALL DIFFUSERS AND REGISTERS.

13. FILTERS:
   A. FILTERS SHALL BE U.L. APPROVED. SEE SCHEDULE.
   B. RIGID/SUPPORTED FILTER SHALL OPERATE ON THE PRINCIPLES OF IMPRINGEMENT, STRAINING, AND DIFFUSION.
   C. ALL FILTERS SHALL BE CERTIFIED BY THE MANUFACTURER AND INSTALLED IN COMPLIANCE WITH 2013 EDITION OF THE CMC.

14. INSULATION:
   A. INSULATION SHALL BE U.L. LISTED IN COMPLIANCE WITH FLAME–SPREAD RATING AND SMOKE DENSITY REQUIREMENTS OF THE UNIFORM BUILDING CODE. INSTALLA–TION SHALL BE IN ACCORDANCE WITH THE STATE OF CALIFORNIA ENERGY COMMISSION REQUIREMENTS.
   B. ALL SUPPLY AND RETURN DUCTS SHALL BE LINED DUCTWORK. DUCT DIMENSIONS SHOWN ARE FREE INTERNAL DIMENSIONS.
   C. CONDENSATE PIPING SHALL BE INSULATED WITH 3/8" FOAM PLASTIC.
   D. COLD AIR DUCTS SHALL BE INSULATED TO PREVENT CONDENSATION PROBLEM.

15. PIPING:
   A. PROVIDE HANGERS AND SUPPORTS AS REQUIRED. PLUMBERS TAPE AND WIRE ARE NOT ACCEPTABLE.
   B. CONDENSATE PIPING SHALL BE TYPE "M" COPPER.

16. CONTRACTOR SHALL AFFIX A MAINTENANCE LABEL TO ALL EQUIPMENT REQUIRING ROUTINE MAINTENANCE AND SHALL PROVIDE THREE COPIES OF MAINTENANCE AND OPERATING MANUALS TO THE OWNER.

17. ROUGH–IN AND CONNECT EQUIPMENT PROVIDED UNDER OTHER SECTIONS OF THE WORK.

18. THE CONTRACTOR SHALL BE RESPONSIBILE FOR VERIFYING AVAILABLE SPACE FOR INSTALLATION OF NEW WORK.

19. HIGH VOLTAGE CONDUIT AND WIRE AND LOW VOLTAGE CONDUIT SHALL BE UNDER ELECTRICAL SECTION OF THE WORK. LOW VOLTAGE WIRING SHALL BE UNDER THIS SECTION OF THE WORK.

20. BALANCING AND ADJUSTING: ALL AIR SYSTEMS SHALL BE ADJUSTED BY AN INDEPEN–DENT BALANCING CONTRACTOR THAT IS A MEMBER OF THE AABC'S NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE (6TH ED.). SUBMIT BALANCE REPORT TO OWNER. ADDITIONAL BALANCING DAMPERS AND/OR PULLEY CHANGES SHALL BE PROVIDED AS REQUIRED TO BALANCE SYSTEMS, AT NO INCREASE IN CONTRACT PRICE.

21. BEFORE STARTING ANY WORK, THE CONTRACTOR FOR THIS SECTION OF THE WORK SHALL EXAMINE A COMPLETE SET OF DRAWINGS FOR ALL TRADES, INCLUDING ARCHITECTURAL, HVAC, ELECTRICAL, FIRE PROTECTION AND PLUMBING. DIMENSIONS, SPACE REQUIRE–MENTS AND POINTS OF CONNECTION TO ALL EQUIPMENT SHALL BE VERIFIED, AND ANY MINOR ADJUSTMENTS NECESSARY TO AVOID CONFLICT WITH THE BUILDING STRUCTURE AND THE WORK OF THE OTHER TRADES SHALL BE MADE.

22. PERMANENT ACCESS TO ALL EQUIPMENT INCLUDING FIRE DAMPERS & SMOKE FIRE DAMPERS SHALL BE PROVIDED.

23. EQUIPMENT SHALL BE SECURELY FASTENED TO VIBRATION ISOLATORS AND EARTHQUAKE RESTRAINTS PER BUILDING CODE REQUIREMENTS.

24. EACH PIECE OF EQUIPMENT AND ALL SYSTEMS SHALL BE ADJUSTED AND RE–ADJUSTED TO INSURE PROPER FUNCTION OF ALL CONTROLS, MAINTENANCE OF TEMPERATURE, ELIMINATION OF NOISE AND VIBRATION, AND SHALL BE LEFT IN PROPER OPERATING CONDITION.

25. NO COMBUSTIBLE MATERIALS SHALL BE INSTALLED IN RETURN AIR PLENUMS.

26. ACCESS DOORS: WHERE NECESSARY IN DUCTWORK OR CASINGS, SUITABLE ACCESS DOORS AND FRAMES TO PERMIT INSPECTION, OPERATION AND MAINTENANCE OF ALL CONTROLS, MOTOR BEARINGS, OR OTHER APPARATUS CONCEALED BEHIND THE SHEET METAL WORK SHALL BE PROVIDED. ACCESS DOORS IN DUCTS MAY BE OF SINGLE PANEL CONSTRUCTION OF NOT LESS THAN NO. 18 GAUGE, GALVANIZED, AND SHALL HAVE SPONGE RUBBER GASKETS WITH HINGES AND LATCHES.

27. A MINIMUM OF 30" CLEAR WORKING SPACE IN FRONT OF ACCESS PANELS TO THE COMPRESSOR, BLOWER ASSEMBLY AND AIR FILTER SECTION SHALL BE PROVIDED.

28. ALL VENT PIPING SHALL TERMINATE NOT LESS THAN TEN (10) FEET FROM ANY AIR INTAKE OR VENT SHAFT.

29. ANCHORAGE AND SUPPORTING STRUCTURAL ELEMENTS FOR AIR DUCTS SHALL BE DESIGNED TO WITHSTAND THE LATERAL FORCES AS REQUIRED BY THE CALIFORNIA BUILDING CODE.

30. PROVIDE AUTOMATIC SHUT OFF BY DETECTION OF SMOKE IN MAIN SUPPLY AIR DUCT AS REQUIRED BY 2013 CMC 609.0.

31. PRIOR TO MECHANICAL FINAL INSPECTION, A SMOKE DETECTOR SHUT–OFF TEST WILL BE REQUIRED PER 2013 CMC.

32. CENTRAL AIR HANDLING SYSTEMS SHALL BE MAINTAINED IN CLEAN CONDITION DURING CONSTRUCTION AND SHALL BE CLEANED AS NECESSARY PRIOR TO REPLACEMENT OF TEMPORARY FILTER USED DURING CONSTRUCTION TO ENSURE THAT CLEAN AIR WILL BE DELIVERED TO THE OCCUPIED SPACE.

33. ANCHORAGE AND SUPPORTING STRUCTURAL ELEMENTS FOR AIR DUCTS SHALL BE DESIGNED TO WITHSTAND THE LATERAL FORCE AS REQUIRED BY THE 2013 CALIFORNIA BUILDING CODE.

34. FLEXIBLE DUCT NO MORE THAN 10 FEET IN LENGTH MAY BE USED TO CONNECT SUPPLY, RETURN OR EXHAUST AIR TEMINAL DEVICES TO RIGID DUCT SYSTEMS. 2010 CMC.

35. A COPY OF AIR BALANCE REPORT SHALL BE PROVIDED TO MECHANICAL SECTION FOR FINAL REVIEW BEFORE CLINIC CERTIFICATION.

36. VENTILATION SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH THE LATEST EDITION OF STANDARDS PUBLISHED BY THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).

37. OUTDOOR AIR INTAKES SHALL BE LOCATED AT LEAST 10 FEET FROM EXHAUST OUTLETS OF VENTILATING SYSTEMS, COMBUSTION EQUIPMENT STACKS, MEDICAL–SURGICAL VACUUM SYSTEMS, COOLING TOWERS AND AREAS THAT MAY COLLECT VEHICULAR EXHAUST OR OTHER NOXIOUS FUMES. THE BOTTOM OF OUTDOOR AIR INTAKES SHALL BE LOCATED NOT LESS THAN 10 FEET ABOVE GROUND LEVEL OR 18 INCHES ABOVE ROOF LEVEL.

38. EXHAUST OUTLETS SHALL BE LOCATED A MINIMUM OF 10 FEET ABOVE ADJOINING GRADE AND 10 FEET FROM DOORS, OCCUPIED AREAS AND OPERABLE WINDOWS.

39. ALL WORK TO COMPLY WITH 2013 CALIFORNIA MECHANICAL CODE.

40. PROVIDE AIR BALANCE REPORT TO VERIFY THE PROPER AMOUNT OF OUTSIDE AIR TO COMPLY WITH THE TITLE 24 CALCULATIONS, BEFORE THE APPROVAL OF THIS PROJECT.

41. AIR HANDLING DUCT SYSTEMS SHALL BE CONSTRUCTED, INSTALLED AND INSULATED AS PROVIDED IN 2013 CMC.

42. A 7 DAY, 24–HOUR TIME CLOCK OR A PROGRAMMABLE THERMOSTAT SHALL BE PROVIDED ON HVAC UNIT THAT AUTOMATICALLY SHUT DOWN DURING PERIODS OF NON–USE. THERMOSTAT SHALL BE MOUNTED BETWEEN 3 AND 4 FEET ABOVE FINISHED FLOOR.

43. ALL NEW DUCTS AND OTHER NEW RELATED AIR DISTRIBUTION COMPONENTS OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC OR SHEETMETAL UNTIL THE FINAL STARTUP OF THE HEATING, COOLING AND VENTILATING EQUIPMENT.

44. AN AIR BALANCE TEST WILL BE REQUIRED TO VERIFY THE MINIMUM VOLUME OF OUTSIDE AIR TO COMPLY WITH THE T–24 CALCULATIONS, BEFORE THE FINAL APPROVAL OF THIS PROJECT.

45. ONLY CO2 SENSORS THAT DIRECTLY TRACK THE CO2 LEVEL IN THE BREATHING ZONE ARE PERMITTED BY CEC FOR USE IN THE DEMAND CONTROLLED VENTILATION REQUIREMENT FOR T–24 COMPLIANCE.

FIELD VERIFICATION

1. SITE INSPECTION: CONTRACTOR SHALL VISIT THE SITE OF WORK AND THOROUGHLY FAMILIARIZE HIMSELF WITH THE WORKING CONDITIONS AND EXACT NATURE OF THE WORK PRIOR TO SUBMISSION OF HIS BID. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS. SHOULD ANY CONDITION ARISE WHERE THE INTENT OF THE DRAWING IS IN DOUBT OR WHERE THERE IS A DISCREPANCY BETWEEN THE DRAWINGS AND FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR CLARIFICATION PRIOR TO SUBMISSION OF HIS BID. SUBMISSION OF A BID ACKNOWLEDGES FULL RESPONSIBILITY FOR FURNISHING A COMPLETE AND FUNCTIONAL SYSTEM. NO CHANGES IN CONTRACT WILL BE MADE TO ACCOMMODATE OR ALLOW EXTRA FUNDS FOR ANY OMISSION WHICH RESULTS FROM A FAILURE TO THOROUGHLY MAKE THE EXAMINATION.

2. AS–BUILTS: CONTRACTOR SHALL PROVIDE A COMPLETE SET OF AS–BUILT FULL SIZE BLACKLINE PRINTS WITH ALL CHANGES NOTED THEREON AT THE COMPLETION OF THE PROJECT AND PRIOR TO FINAL ACCEPTANCE AND PAYMENT.

NO.	DATE	DESCRIPTION
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REGISTERED PROFESSIONAL ENGINEER
ERNESTO PILOT
No. M–35319
EXP. 06–30
MECHANICAL
STATE OF CALIFORNIA

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LEGENDS, NOTES & SCHEDULES

SHEET: M–1

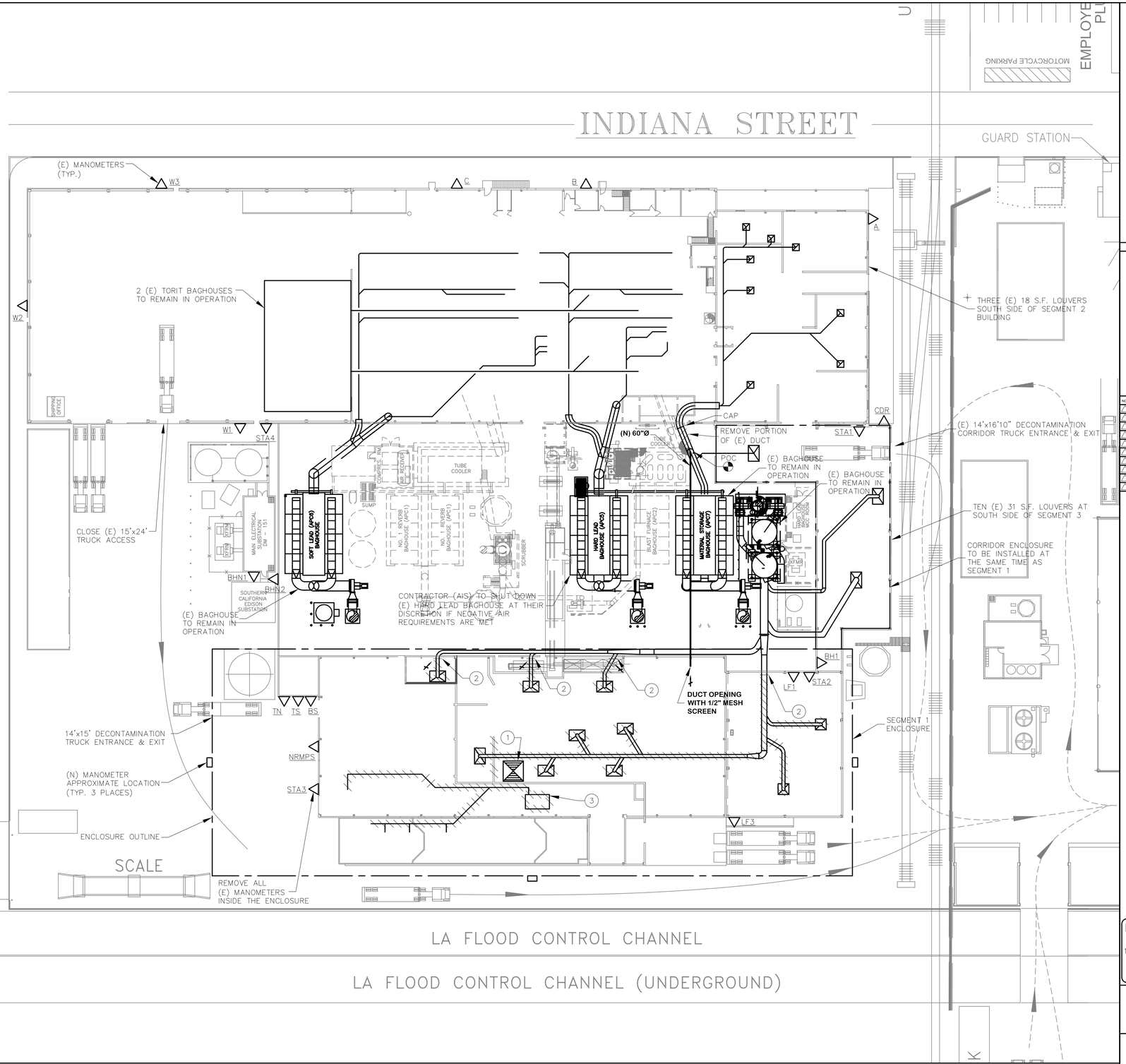
SCALE: NTS	DRAWN BY: DRA
JOB #:	ISSUE DATE: MAY 2016

NUMBERED NOTES (NOT SEQUENTIAL)

1. APPROXIMATE LOCATION OF 12'x12' CRANE ACCESS ON ROOF
2. CUT (E) DUCT & REMOVE. LEAVE REMAINING DUCT OPEN WITH 1/2" MESH SCREEN.
3. REMOVE (E) MAPCO SCRUBBER & APPURTENANCES

GENERAL NOTES

1) THE WORK AREA WILL HAVE ONE TRUCK ACCESS OPENING (210 S.F.) AND ENGINEERED OPENINGS (144 S.F.) EQUAL TO A TOTAL AREA OF 354 S.F.
2) ENGINEERED OPENINGS EQUAL TO 144 S.F. WILL BE CREATED TO MAINTAIN A MINIMUM NEGATIVE PRESSURE OF AT LEAST 0.02 INCHES OF WATER. SHOULD THE TRUCK ACCESS DOOR BE OPENED OR AN OPENING CREATED FOR REMOVAL OF BAGHOUSE STACKS BE CREATED, SELECTED ENGINEERED OPENINGS WILL BE CLOSED TO MAINTAIN AT LEAST 0.02 INCHES OF WATER.
3) ANEMOMETERS WILL BE PLACED ONLY AT DOORWAYS.
4) THE EXISTING MANOMETERS (A, B, C, CDR, STA1, BHN1, BHN2, W1, W2, W3, & STA4) WILL MONITOR THE SEGMENT 2 & SEGMENT 3 BUILDINGS.
5) ALL THREE BUILDINGS (SEGMENT 1, 2 & 3 BUILDINGS) WILL MAINTAIN A MINIMUM NEGATIVE PRESSURE OF AT LEAST 0.02 INCHES OF WATER
6) SEGMENT 1 BUILDING EXTERIOR SHEETING MAY BE REMOVED AT CONTRACTOR'S DISCRETION ONCE ENCLOSURE IS IN PLACE.
7) ALL EXISTING MANOMETERS (BH1, STA2, LF1, LF3, TN, TS, BS, NRMPS, & STA3) INSIDE THE ENCLOSURE WILL BE REMOVED.



DEMOLITION PLAN - SEGMENT 1

SCALE: 1"=30'

N

NO.	DATE	DESCRIPTION

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DEMOLITION PLAN
SEGMENT 1

SHEET: M-2

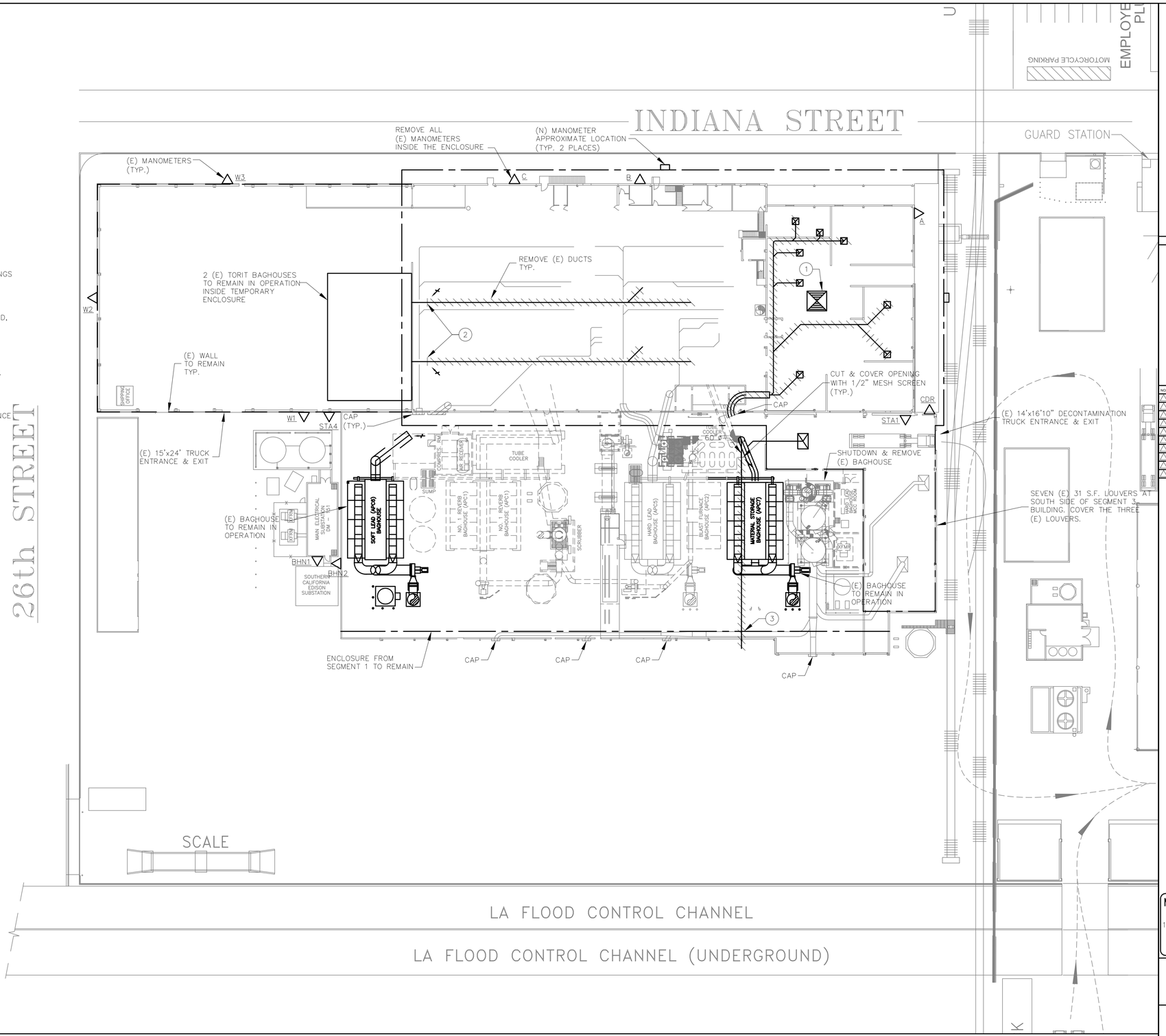
SCALE:	1"=30'	DRAWN BY:	DRA
JOB #:		ISSUE DATE:	MAY 2016

NUMBERED NOTES (NOT SEQUENTIAL)

1. APPROXIMATE LOCATION OF 12'x12' CRANE ACCESS ON ROOF
2. CUT (E) DUCT & REMOVE. LEAVE REMAINING DUCT OPEN WITH 1/2" MESH SCREEN.
3. REMOVE DUCTS & PATCH OPENING ON THE WALL

GENERAL NOTES

1) THE WORK AREA WILL HAVE ONE TRUCK ACCESS OPENING (236 S.F.) AND ENGINEERED OPENINGS (144 S.F.) EQUAL TO A TOTAL AREA OF 380 S.F.
2) ENGINEERED OPENINGS EQUAL TO 144 S.F. WILL BE CREATED TO MAINTAIN A MINIMUM NEGATIVE PRESSURE OF AT LEAST 0.02 INCHES OF WATER. SHOULD THE TRUCK ACCESS DOOR BE OPENED OR AN OPENING CREATED FOR REMOVAL OF BAGHOUSE STACKS BE CREATED, SELECTED ENGINEERED OPENINGS WILL BE CLOSED TO MAINTAIN AT LEAST 0.02 INCHES OF WATER.
3) ANEMOMETERS WILL BE PLACED ONLY AT DOORWAYS.
4) THE EXISTING MANOMETERS: BHN1 & BHN2, WILL MONITOR THE SEGMENT 3 BUILDING AND THE EXISTING MANOMETERS: STA4, W1, W2 & W3, WILL MONITOR THE FINISHED LEAD BUILDING.
5) THE TWO BUILDINGS (SEGMENT 2 & 3 BUILDINGS) WILL MAINTAIN A MINIMUM NEGATIVE PRESSURE OF AT LEAST 0.02 INCHES OF WATER
6) SEGMENT 2 BUILDING EXTERIOR SHEETING MAY BE REMOVED AT CONTRACTOR'S DISCRETION ONCE ENCLOSURE IS IN PLACE.
7) ALL EXISTING MANOMETERS (A, B, C, CDR, & STA1) INSIDE THE ENCLOSURE WILL BE REMOVED.



DEMOLITION PLAN - SEGMENT 2

SCALE: 1"=30'

N

NO.	DATE	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER ERNESTO PLOTT No. M-35319 EXP. 6-30-2017 MECHANICAL STATE OF CALIFORNIA

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DEMOLITION PLAN SEGMENT 2

SHEET: M-3

SCALE: 1"=30' | DRAWN BY: DRA

JOB #: | ISSUE DATE: MAY 2016

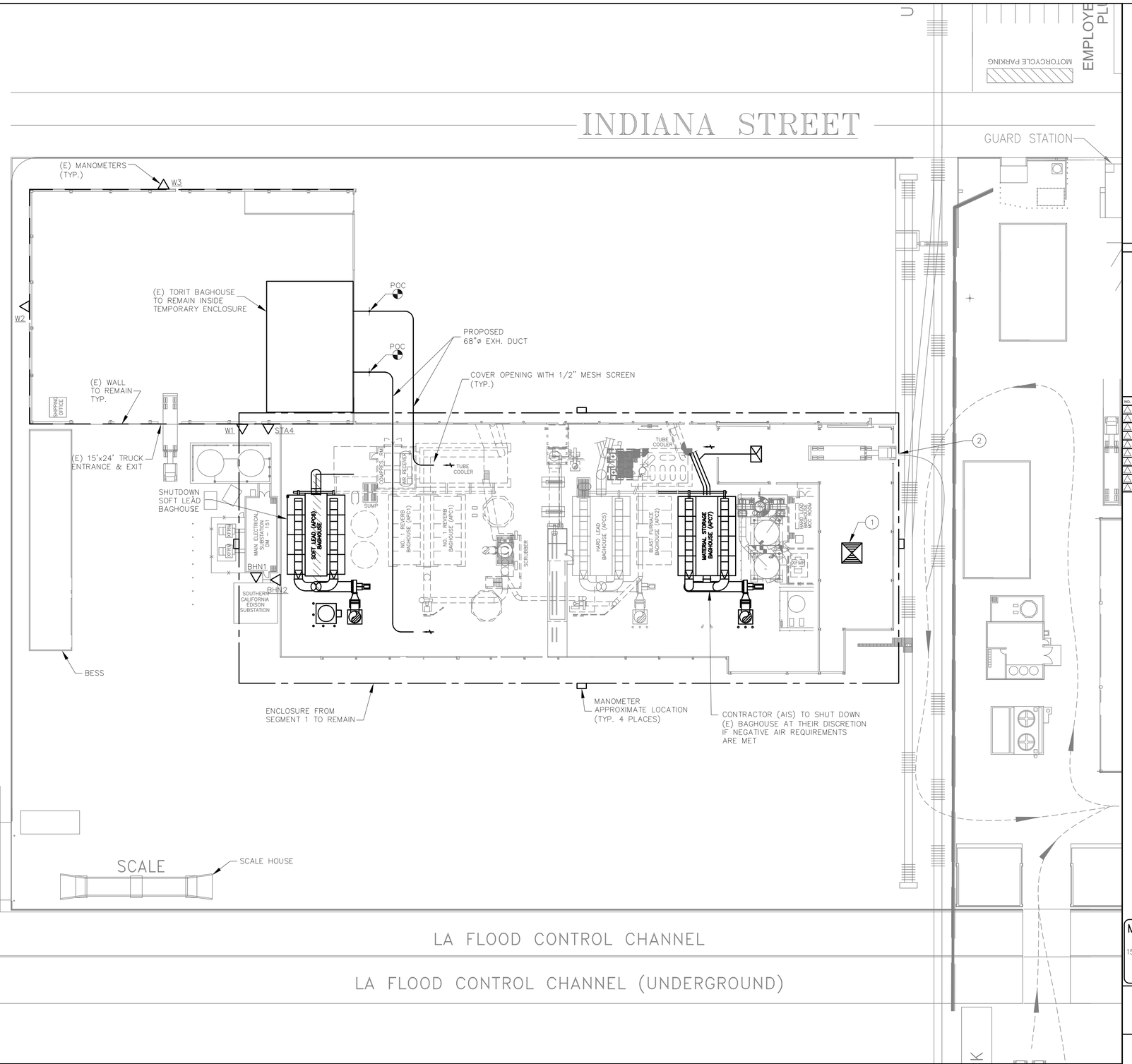
NUMBERED NOTES (NOT SEQUENTIAL)

(1) APPROXIMATE LOCATION OF 12'x12' CRANE ACCESS ON ROOF

(2) 14'x16'10" DECONTAMINATION TRUCK ENTRANCE & EXIT

GENERAL NOTES

1) THE WORK AREA WILL HAVE ONE TRUCK ACCESS OPENING (236 S.F.) AND ENGINEERED OPENINGS (144 S.F.) EQUAL TO A TOTAL AREA OF 380 S.F.
2) ENGINEERED OPENINGS EQUAL TO 144 S.F. WILL BE CREATED TO MAINTAIN A MINIMUM NEGATIVE PRESSURE OF AT LEAST 0.02 INCHES OF WATER. SHOULD THE TRUCK ACCESS DOOR BE OPENED OR AN OPENING CREATED FOR REMOVAL OF BAGHOUSE STACKS BE CREATED, SELECTED ENGINEERED OPENINGS WILL BE CLOSED TO MAINTAIN AT LEAST 0.02 INCHES OF WATER.
3) ANEMOMETERS WILL BE PLACED ONLY AT DOORWAYS.
4) THE EXISTING MANOMETERS (W2 & W3) WILL MONITOR THE FINISHED LEAD BUILDING.
5) THE SEGMENT 3 BUILDING WILL MAINTAIN A MINIMUM NEGATIVE PRESSURE OF AT LEAST 0.02 INCHES OF WATER
6) SEGMENT 3 BUILDING EXTERIOR SHEETING MAY BE REMOVED AT CONTRACTOR'S DISCRETION ONCE ENCLOSURE IS IN PLACE.
7) ALL EXISTING MANOMETERS (W1, STA4, BHN1 & BHN2) INSIDE THE ENCLOSURE WILL BE REMOVED.



DEMOLITION PLAN - SEGMENT 3

SCALE: 1"=30'

N

NO.	DATE	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER ERNESTO PLOTT No. M-35319 EXP. 6-30-2017 MECHANICAL STATE OF CALIFORNIA

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DEMOLITION PLAN SEGMENT 3

SHEET: M-4

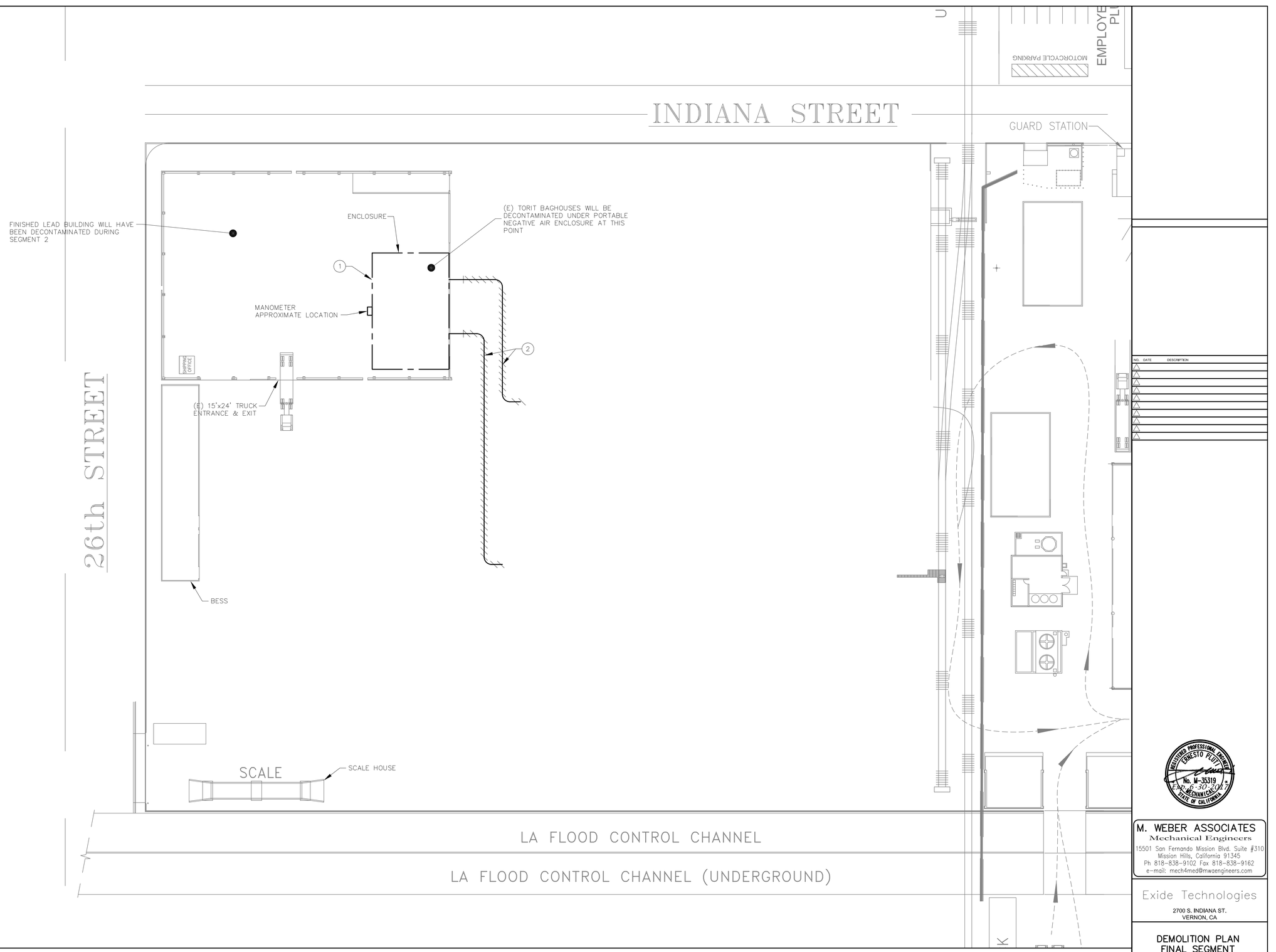
SCALE: 1"=30' | DRAWN BY: DRA

JOB #: | ISSUE DATE: MAY 2016

NUMBERED NOTES

(1) SHUT DOWN TORIT BAGHOUSE FOR DECONTAMINATION

(2) CUT (E) DUCT & REMOVE. LEAVE REMAINING DUCT OPEN.



DEMOLITION PLAN - FINAL SEGMENT

SCALE: 1"=30'

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NO.	DATE	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER ERNESTO FLUIT No. M-35319 EXP. 6-30-2017 MECHANICAL STATE OF CALIFORNIA

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DEMOLITION PLAN
FINAL SEGMENT

SHEET: M-5

SCALE: 1"=30'	DRAWN BY: DRA
JOB #:	ISSUE DATE: MAY 2016